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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,893	01/17/2001	Shih-Chieh Hung	11709-003001	6011

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EXAMINER	
DUNSTON, JENNIFER ANN	
ART UNIT	PAPER NUMBER
1636	
MAIL DATE	DELIVERY MODE
04/06/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/761,893	HUNG ET AL.	
	Examiner	Art Unit	
	Jennifer Dunston	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 January 2001*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6,9-20 and 34-38* is/are pending in the application.

4a) Of the above claim(s) *12-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6,9-11 and 34-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to the amendment, filed 1/31/2011, in which claim 41 was canceled, and claims 1, 34 and 35 were amended. Claims 1, 4, 6, 9-20 and 34-38 are pending.

Applicant's arguments have been thoroughly reviewed, but are not persuasive for the reasons that follow. Any rejections and objections not reiterated in this action have been withdrawn. **This action is FINAL.**

Election/Restrictions

Applicant elected Group I without traverse in the reply filed on 9/4/2001.

Claims 12-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9/4/2001.

Currently, claims 1, 4, 6, 9-11 and 34-38 are under consideration.

Response to Arguments - Claim Objections

The previous objections of claims 1, 4, 6, 9-11, 34-38 and 41 have been withdrawn in view of Applicant's amendment to the claims in the reply filed 1/31/2011.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 4, 6, 9-11 and 34-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This is a new rejection, necessitated by the amendment filed 1/31/2011.

In the amendment of claim 1, filed 1/31/2011, the phrase "lower plate base, where the other small-sized hematopoietic and non-hematopoietic cells adhere following passing through the pores in the upper plate" was changed to "lower plate base, where small-sized cells passing through the pores in the upper plate." Removal of the phrase "adhere following" renders the language claim indefinite. The claim no longer provides a relationship between the location of the small-sized cells and the lower plate, thereby rendering the metes and bounds of the claim unclear. It would be remedial to amend the claim to recite "where small-sized cells passing through the pores in the upper plate adhere."

Claims 4, 6, 9-11 and 34-38 depend from claim 1 and are rejected for the same reasons applied to claim 1.

Response to Arguments - 35 USC § 112

The rejection of claim 41 under 35 U.S.C. 112, second paragraph, is moot in view of Applicant's cancellation of the claim in the reply filed 1/31/2011.

The rejection of claims 1, 4, 6, 9-11 and 34-38 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicant's amendment to claim 1 in the reply filed 1/31/2011.

The rejection of claim 41 under 35 U.S.C. 112, first paragraph (new matter), is moot in view of Applicant's cancellation of the claim in the reply filed 1/31/2011.

The rejection of claim 41 under 35 U.S.C. 112, first paragraph (enablement), is moot in view of Applicant's cancellation of the claim in the reply filed 1/31/2011.

The rejection of claims 1, 4, 6, 9-11 and 34-38 under 35 U.S.C. 112, first paragraph (enablement), has been withdrawn in view of Applicant's amendment to the claims in the reply filed 1/31/2011. The claims no longer require the separation of mesenchymal stem cells and hematopoietic cells by the plate containing pores.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4, 6, 9, 11 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caplan et al (US Patent No. 5,811,094, cited in a prior action; see the entire reference) in view of Prockop et al (US Patent No. 7,374,937 B1, effective date March 14, 2000, cited in a

prior action; see the entire reference) and Matsui et al (US Patent No. 4,871,674, cited in a prior action; see the entire reference). This is a new rejection, necessitated by the amendment of claim 1 in the reply filed 1/31/2011.

Caplan et al teach the isolation of human mesenchymal stem cells from aspirated marrow, comprising the steps of (i) applying the cells to a Percoll gradient and collecting the low density platelet fraction containing marrow-derived mesenchymal stem cells, platelet cells, and red blood cells; (ii) placing the cells in complete medium; (iii) allowing the cells to adhere to the surface of Petri dishes for one to seven days; and (iv) removing non-adherent cells after three days by replacing the original complete medium with fresh complete medium (e.g., column 11, line 63 to column 12, line 25). Caplan et al teach that complete medium and Dulbecco's modified Eagle's medium containing 10% fetal bovine serum and 1 g/L of glucose stimulates mesenchymal stem cell growth without differentiation and allows for the selective attachment of only mesenchymal stem cells to the plastic surfaces of the Petri dishes (e.g., column 8, line 45 to column 9, line 55; column 45, line 45 to column 46, line 34). Caplan et al teach that mesenchymal stem cells can be grown until the culture dishes become confluent (e.g., paragraph bridging columns 19-20). Caplan et al teach that when the culture dishes become confluent, the cells are detached with 0.25% trypsin with 0.1 mM EDTA for 10-15 minutes at 37° C, the action of trypsin is stopped with fetal bovine serum, the cells are counted, split 1:3 and replated in 7 ml of complete medium (e.g., paragraph bridging columns 19-20; paragraph bridging columns 40-41). Caplan et al teach plating the recovered cells into 35 mm plates at 50,000 cells, which is a density of about 5 x $10^3/cm^2$ (e.g., column 41). Caplan et al teach that the mesenchymal stem cells can differentiate into bone, cartilage or adipose tissue (e.g., column 1, lines 40-52; column 47, lines 9-48).

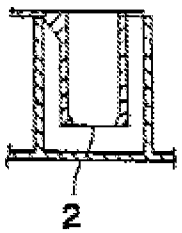
Moreover, Caplan et al teach that a porous filter can be used to remove red blood cells from the mesenchymal stem cells to provide an enriched population of mesenchymal stem cells (e.g., column 45, line 45 to column 46, line 34).

Caplan et al do not teach the method of isolating human mesenchymal stem cells where the mixed population of cells in medium is seeded into a culture device comprising an upper plate with pores and a lower plate base, where small cells pass through the pores in the upper plate and adhere to the lower plate.

Prockop et al teach that RS cells can be separated from non-RS mesenchymal stem cells by ultrafiltration. Prockop et al teach that smaller RS cells will pass through an ultrafiltration membrane having appropriately sized pores, and such a membrane is a Millipore brand 10 micrometer isopore polycarbonate (plastic) membrane (e.g., column 39, line 60 to column 40, line 42).

Matsui et al teach culturing cells in a cell culture device comprising a cell culture insert comprising a membrane filter (2) on the bottom of the culture cell, which is composed of polycarbonate (e.g., column 2, lines 41-55; column 3, lines 5-18). The culture device is shown in Figure 8, which is reproduced below:

Fig. 8



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of isolating mesenchymal stem cells of Caplan et al to include the introduction of the mixed composition of cells comprising mesenchymal stem cells and medium into the culture dish taught by Matsui et al because Caplan et al teach that mesenchymal stem cells adhere to plastic for culturing, and Caplan et al teach it is within the ordinary skill in the art to use a filter to remove fat cells and red blood cells from cells of bone marrow. Furthermore, Prockop et al teach the collection of mesenchymal stem cells on a filter of polycarbonate containing 10 micrometer pores, and Matsui et al teach culturing cells in a device comprising a polycarbonate filter.

One would have been motivated to make such a modification in order to receive the expected benefit of providing an enriched population of mesenchymal stem cells without having to perform the extra steps of using a separate filter as taught by Caplan et al, since red blood cell removal and mesenchymal stem cell culture could be performed simultaneously using the culture dish of Matsui et al. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent any evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Caplan et al (US Patent No. 5,811,094, cited in a prior action; see the entire reference) in view of Prockop et al (US Patent No. 7,374,937 B1, effective date March 14, 2000, cited in a prior action; see the entire reference) and Matsui et al (US Patent No. 4,871,674, cited in a prior action; see the entire reference) as applied to claims 1, 4, 6, 9, 11 and 34-38 above, and further in view of Pittenger et

al (Science, Vol. 284, pages 143-147, 1999, cited in a prior action; see the entire reference). This is a new rejection, necessitated by the amendment of claim 1 in the reply filed 1/31/2011.

The combined teachings of Caplan et al, Prockop et al, and Matsui et al are described above and applied as before.

Caplan et al, Prockop et al, and Matsui et al do not specifically teach that the mesenchymal stem cells are CD34-.

Pittenger et al teach the isolation of human mesenchymal cells from bone marrow taken from the iliac crest (e.g., page 143, right column). Pittenger et al teach that the mesenchymal stem cells are CD34- (e.g., paragraph bridging pages 143-144). The mesenchymal stem cells isolated by Pittenger et al are capable of differentiating to adipose, cartilage or bone tissue (e.g., Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specifically use a bone marrow aspirate from human iliac crest, because Caplan et al and Pittenger et al teach the use of bone marrow from iliac crest to isolate mesenchymal stem cells that are capable of differentiating to adipose, cartilage or bone tissue (e.g., Figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute iliac crest bone marrow for any other type of bone marrow to achieve the predictable result of recovering CD34- mesenchymal stem cells that are also capable of differentiating to adipose, cartilage or bone tissue.

Claims 1, 4, 6, 9, 11 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caplan et al (US Patent No. 5,811,094, cited in a prior action; see the entire reference) in

view of Burkitt et al (Wheater's Functional Histology (1993), page 60, cited in a prior action) and Mussi et al (US Patent No. 5,409,829, cited in a prior action; see the entire reference). This is a new rejection, necessitated by the amendment of claim 1 in the reply filed 1/31/2011.

Caplan et al teach the isolation of human mesenchymal stem cells from aspirated marrow, comprising the steps of (i) applying the cells to a Percoll gradient and collecting the low density platelet fraction containing marrow-derived mesenchymal stem cells, platelet cells, and red blood cells; (ii) placing the cells in complete medium; (iii) allowing the cells to adhere to the surface of Petri dishes for one to seven days; and (iv) removing non-adherent cells after three days by replacing the original complete medium with fresh complete medium (e.g., column 11, line 63 to column 12, line 25). Caplan et al teach that complete medium and Dulbecco's modified Eagle's medium containing 10% fetal bovine serum and 1 g/L of glucose stimulates mesenchymal stem cell growth without differentiation and allows for the selective attachment of only mesenchymal stem cells to the plastic surfaces of the Petri dishes (e.g., column 8, line 45 to column 9, line 55; column 45, line 45 to column 46, line 34). Caplan et al teach that mesenchymal stem cells can be grown until the culture dishes become confluent (e.g., paragraph bridging columns 19-20). Caplan et al teach that when the culture dishes become confluent, the cells are detached with 0.25% trypsin with 0.1 mM EDTA for 10-15 minutes at 37° C, the action of trypsin is stopped with fetal bovine serum, the cells are counted, split 1:3 and replated in 7 ml of complete medium (e.g., paragraph bridging columns 19-20; paragraph bridging columns 40-41). Caplan et al teach plating the recovered cells into 35 mm plates at 50,000 cells, which is a density of about 5 x $10^3/cm^2$ (e.g., column 41). Caplan et al teach that the mesenchymal stem cells can differentiate into bone, cartilage or adipose tissue (e.g., column 1, lines 40-52; column 47, lines 9-48).

Moreover, Caplan et al teach that a porous filter can be used to remove red blood cells from the mesenchymal stem cells to provide an enriched population of mesenchymal stem cells (e.g., column 45, line 45 to column 46, line 34).

Caplan et al do not teach the method of isolating human mesenchymal stem cells where the mixed population of cells in medium is seeded into a culture device comprising an upper plate with pores and a lower plate base, where small cells pass through the pores in the upper plate and adhere to the lower plate.

Burkitt et al teach that red blood cells are 6.7-7.7 μm in diameter and nucleated cells have a diameter greater than 7.7 μm (page 60).

Mussi et al teach the introduction of a mixture of cells to be grown into a culture chamber in a suitable growth medium (e.g., column 2, lines 46-50). Mussi et al teach that the cells are grown in a culture insert contained within a well, where the insert is suspended in the well (e.g., paragraph bridging columns 3-4; Figure 4). The culture insert contains a membrane (20), which may be formed from a polymeric material such as polyethylene terephthalate, polycarbonate, and the like with open pores throughout (e.g., column 3, lines 50-53). Mussi et al teach that the pores are between about 0.2 to about 10 microns in diameter (e.g., column 3, lines 53-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of isolating mesenchymal stem cells of Caplan et al to include the introduction of the mixed composition of cells comprising mesenchymal stem cells in medium into the culture insert of the culture device of Mussi et al because Caplan et al teach it is within the ordinary skill in the art to use a filter to remove red blood cells from cells of bone marrow aspirate and Mussi et al teach the use of a porous polycarbonate filter membrane, where

the pore diameter can be about 0.2 to about 10 microns in diameter, and Burkitt et al teach that red blood cells are the size which would pass through the filter of Mussi et al while nucleated mesenchymal stem cells of Caplan et al would be retained on top.

One would have been motivated to make such a modification in order to provide an enriched population of mesenchymal stem cells without the extra steps of using a column containing a filter as taught by Caplan et al, since red blood cell removal and mesenchymal stem cell culture could be performed simultaneously using the culture dish of Mussi et al. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent any evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Caplan et al (US Patent No. 5,811,094, cited in a prior action; see the entire reference) in view of Burkitt et al (Wheater's Functional Histology (1993), page 60, cited in a prior action) and Mussi et al (US Patent No. 5,409,829, cited in a prior action; see the entire reference) as applied to claims 1, 4, 6, 9, 11 and 34-38 above, and further in view of Pittenger et al (Science, Vol. 284, pages 143-147, 1999, cited in a prior action; see the entire reference). This is a new rejection, necessitated by the amendment of claim 1 in the reply filed 1/31/2011.

The combined teachings of Caplan et al, Burkitt et al, and Matsui et al are described above and applied as before.

Caplan et al, Burkitt et al, and Matsui et al do not specifically teach that the mesenchymal stem cells are CD34-.

Pittenger et al teach the isolation of human mesenchymal cells from bone marrow taken from the iliac crest (e.g., page 143, right column). Pittenger et al teach that the mesenchymal stem cells are CD34- (e.g., paragraph bridging pages 143-144). The mesenchymal stem cells isolated by Pittenger et al are capable of differentiating to adipose, cartilage or bone tissue (e.g., Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specifically use a bone marrow aspirate from human iliac crest, because Caplan et al and Pittenger et al teach the use of bone marrow from iliac crest to isolate mesenchymal stem cells that are capable of differentiating to adipose, cartilage or bone tissue (e.g., Figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute iliac crest bone marrow for any other type of bone marrow to achieve the predictable result of recovering CD34- mesenchymal stem cells that are also capable of differentiating to adipose, cartilage or bone tissue.

Claims 1, 4, 6, 9, 11 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caplan et al (US Patent No. 5,811,094, cited in a prior action; see the entire reference) in view of Guirguis (US Patent No. 5,077,012, cited in a prior action; see the entire reference) and Matsui et al (US Patent No. 4,871,674, cited in a prior action; see the entire reference). This is a new rejection, necessitated by the amendment of claim 1 in the reply filed 1/31/2011.

Caplan et al teach the isolation of human mesenchymal stem cells from aspirated marrow, comprising the steps of (i) applying the cells to a Percoll gradient and collecting the low density platelet fraction containing marrow-derived mesenchymal stem cells, platelet cells, and red blood

cells; (ii) placing the cells in complete medium; (iii) allowing the cells to adhere to the surface of Petri dishes for one to seven days; and (iv) removing non-adherent cells after three days by replacing the original complete medium with fresh complete medium (e.g., column 11, line 63 to column 12, line 25). Caplan et al teach that complete medium and Dulbecco's modified Eagle's medium containing 10% fetal bovine serum and 1 g/L of glucose stimulates mesenchymal stem cell growth without differentiation and allows for the selective attachment of only mesenchymal stem cells to the plastic surfaces of the Petri dishes (e.g., column 8, line 45 to column 9, line 55; column 45, line 45 to column 46, line 34). Caplan et al teach that mesenchymal stem cells can be grown until the culture dishes become confluent (e.g., paragraph bridging columns 19-20). Caplan et al teach that when the culture dishes become confluent, the cells are detached with 0.25% trypsin with 0.1 mM EDTA for 10-15 minutes at 37° C, the action of trypsin is stopped with fetal bovine serum, the cells are counted, split 1:3 and replated in 7 ml of complete medium (e.g., paragraph bridging columns 19-20; paragraph bridging columns 40-41). Caplan et al teach plating the recovered cells into 35 mm plates at 50,000 cells, which is a density of about 5 x $10^3/cm^2$ (e.g., column 41). Caplan et al teach that the mesenchymal stem cells can differentiate into bone, cartilage or adipose tissue (e.g., column 1, lines 40-52; column 47, lines 9-48). Moreover, Caplan et al teach that a porous filter can be used to remove red blood cells from the mesenchymal stem cells to provide an enriched population of mesenchymal stem cells (e.g., column 45, line 45 to column 46, line 34).

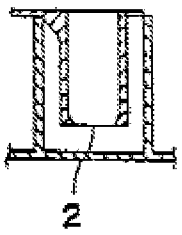
Caplan et al do not teach the method of isolating human mesenchymal stem cells where the mixed population of cells in medium is seeded into a culture device comprising an upper

plate with pores and a lower plate base, where small cells pass through the pores in the upper plate and adhere to the lower plate.

Guirguis teaches the removal of red blood cells from a body fluid using a membrane with a smooth flat surface which is ideal for the collection of atypical cells from all types of body fluids (e.g., column 3, lines 37-45; column 4). Guirguis teaches that the advantage of using a polycarbonate membrane is the minimum clogging by red blood cells and protein, well preserved cellular morphology with a high recovery rate, and excellent surface capture due to the pore structure and porosity (e.g., column 4, lines 43-64).

Matsui et al teach culturing cells in a cell culture device comprising a cell culture insert comprising a membrane filter (2) on the bottom of the culture cell, which is composed of polycarbonate (e.g., column 2, lines 41-55; column 3, lines 5-18). The culture device is shown in Figure 8, which is reproduced below:

Fig. 8



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of isolating mesenchymal stem cells of Caplan et al to include the introduction of the mixed composition of cells comprising mesenchymal stem cells and medium into the culture dish taught by Matsui et al because Caplan et al teach it is within the ordinary skill in the art to culture mesenchymal stem cells on plastic and teach the use a filter to

remove fat cells and red blood cells from cells of bone marrow. Furthermore, Guirguis teaches the use of a polycarbonate membrane for the removal of red blood cells from a body fluid, and Matsui et al teach culturing cells in a device comprising a polycarbonate filter.

One would have been motivated to make such a modification in order to receive the expected benefit of providing an enriched population of mesenchymal stem cells without having to perform the extra steps of using a separate filter as taught by Caplan et al, since red blood cell removal and mesenchymal stem cell culture could be performed simultaneously using the culture dish of Matsui et al. Further, one would have been motivated to use the polycarbonate (plastic) filter in place of the Leukosorb filter taught by Caplan et al, because Caplan et al teach that mesenchymal stem cells become selectively attached to plastic in DMEM containing 10% FBS and 1 g/L of glucose or complete medium, and Guirguis teaches that the advantage of using a polycarbonate membrane is the minimum clogging by red blood cells and protein, well preserved cellular morphology with a high recovery rate, and excellent surface capture due to the pore structure and porosity of the polycarbonate. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent any evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Caplan et al (US Patent No. 5,811,094, cited in a prior action; see the entire reference) in view of Guirguis (US Patent No. 5,077,012, cited in a prior action; see the entire reference) and Matsui et al (US Patent No. 4,871,674, cited in a prior action; see the entire reference) as applied to claims 1, 4, 6, 9, 11 and 34-38 above, and further in view of Pittenger et al (Science, Vol. 284, pages 143-147, 1999,

cited in a prior action; see the entire reference). This is a new rejection, necessitated by the amendment of claim 1 in the reply filed 1/31/2011.

The combined teachings of Caplan et al, Guirguis et al, and Matsui et al are described above and applied as before.

Caplan et al, Guirguis et al, and Matsui et al do not specifically teach that the mesenchymal stem cells are CD34-.

Pittenger et al teach the isolation of human mesenchymal cells from bone marrow taken from the iliac crest (e.g., page 143, right column). Pittenger et al teach that the mesenchymal stem cells are CD34- (e.g., paragraph bridging pages 143-144). The mesenchymal stem cells isolated by Pittenger et al are capable of differentiating to adipose, cartilage or bone tissue (e.g., Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specifically use a bone marrow aspirate from human iliac crest, because Caplan et al and Pittenger et al teach the use of bone marrow from iliac crest to isolate mesenchymal stem cells that are capable of differentiating to adipose, cartilage or bone tissue (e.g., Figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute iliac crest bone marrow for any other type of bone marrow to achieve the predictable result of recovering CD34- mesenchymal stem cells that are also capable of differentiating to adipose, cartilage or bone tissue.

Conclusion

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Dunston whose telephone number is (571)272-2916. The examiner can normally be reached on M-F, 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel can be reached on 571-272-0718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

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Art Unit 1636